

## ABSTRACT

A hybrid mass spectrometer comprises an ion mobility (IMS) section and a mass analysis section that analyses ions based on mass-to-charge ratios. In the IMS section, a DC potential gradient is established and a drift gas provided, so as to separate ions based on varying ion mobilities. Additionally, at least a downstream portion of the IMS section includes a rod set focusing ions along the axis, this prevents loss of ions and gives good transfer of ions into-a-mass analysis section, which can be a time-of-flight mass analyzer or an analyzer including a quadrupole rod set. A collision cell and mass analyzer can be provided between the two sections for MS/MS analysis. The IMS section then provides better utilization of an available sample; as each group of ions is elected from the IMS section, one ion can be mass selected as a precursor, for subsequent fragmentation/ reaction and subsequent mass analysis of the product ions. Another aspect of the invention provides the ability to form potential wells, utilizing a segmented rod set configuration, so as to trap and hold ions after separation based on mobility characteristics.